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January 26, 2005

Ernest Johnson,
Director, Utilities Division
Arizona Corporation Commission
1200 W. Washington
Phoenix, Arizona 85007
Docket Control

RE: SOLAR HVAC PILOT PROGRAM REQUEST UNDER DOCKET NO. RE-00000C-00-0377

Dear Mr. Johnson,

Pursuant to Decision No. 67402, dated November 2, 2004, the Commission approved a limited pilot program for 5 solar heating, ventilation and air conditioning (HVAC) systems. The pilot program would deem the kWhs saved from these systems as eligible to meet a portion of the "solar electric" requirement in the Environmental Portfolio Standard.

Attached for your review and approval is a project description of one solar heating and cooling system, expected to be installed prior to 2007 that APS requests to have accepted in the subject pilot program. As required, this system does include solar air conditioning.

If you or your staff have any questions, please feel free to call Angie Krainik at 602/250-2611 or me.

Sincerely,

Jana Van Ness
Manager
Regulatory Compliance

JVN/AKK

Cc: Ray T. Williamson

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Cochise College Solar Heating, Ventilation and Air Conditioning
Project Description

APS proposes to install a parabolic trough solar system to deliver winter heating and summer time cooling to the central plant at Cochise College, Douglas, Arizona.

A typical schematic of the solar system is shown in Figure 1. The solar system is completely automatic in operation. The system controller monitors sun intensity, wind speed, temperatures, system flow, pressure and other safety parameters. When all is safe, and the sun is shining, the solar collectors track the sun. A glycol anti-freeze solution is pumped through the collectors and delivers heat to the un-pressurized hot water storage tank of about 8000 gallons using an internal heat exchanger. The solar system adds heat to the storage tank as long as its temperature is below the high limit.

The solar system will operate either in a heating or a cooling mode, depending on the time of the year. For the heating system, a plate frame heat exchanger is plumbed into the closed loop system upstream of the gas-fired boiler. If the temperature of the storage tank exceeds the closed loop water heating return temperature by a set amount and, if the water return temperature does not exceed a pre-set maximum, then the solar heating pump starts to deliver heat into the closed loop. This added energy will reduce or eliminate firing of the boiler.

For the cooling system, the chiller condenser is hooked into the existing cooling tower water flow. Chilled water returning from the load flows first through the solar chiller (absorption system) and then into the electric chiller. The temperature of the chilled water returning from the load determines the demand for cooling. If cooling demand exists and the storage tank is hot enough, the solar cooling pump will turn on. Controls within the solar chiller will seek to control the temperature of the chilled water outlet that feeds the electric chiller by varying the energy input from the storage tank. The chilled water supply and return set-points on the solar chiller will be set slightly lower than the set points on the electric chiller so that the electric chiller will only turn on when the solar chiller cannot meet the cooling demand.

COCHISE COLLEGE SOLAR HVAC SYSTEM SCHEMATIC – FIGURE 1